phragm I, that is arranged in suitable proximity to the pole-tip-forming portion of the bobbin. The bobbin is adjustable toward and from the diaphragm to accommodate the formation of the space required between the diaphragm and the tip of the adjacent magnet-pole, and the wire coil G^2 of the bobbin is carefully insulated. The bobbin at its ends is provided with brass or non-magnetic heads *g g*, that to avoid eddy-currents are provided with any suitable number of radially-arranged slots *g'*, arranged, preferably, equidistant apart.

H designates the insulation between the coil and the heads and core of the bobbin and is indicated by heavy black lines. The bobbin's inner head is diametrically larger than its outer head and is engaged at its edge by screws J, that support the bobbin and engage correspondingly-threaded holes *a*, formed in and longitudinally of case A. In the case illustrated four screws J are arranged at equal intervals circumferentially of the bobbin, and each screw has two annular shoulders J' J', arranged apart a distance equal to the thickness of the bobbin's inner head that snugly fit, therefore, between the said shoulders, and the screws between the said shoulders snugly engage said head, that in its surrounding edge has slots g^2, having arc-shaped walls that partially and snugly embrace the screws. By this construction the bobbin, and consequently the pole-tip that forms a part of the bobbin, cannot possibly become displaced independently of the supporting-screws neither endwise nor laterally nor circumferentially, and it is obvious that with the coil-embraced and bobbin-forming pole-tip and body portion of the pole shiftable endwise independently of each other and with the diaghragm and bobbin and pole-tip supported from the bobbin-containing end of the case no expansive or contractive influence upon the case or upon the magnet can affect the relative positions of the said diaphragm and pole-tip, and consequently the said space having been once properly established will not be varied by the aforesaid influence so as to affect the efficiency of the instrument.

The shiftability and lateral flexibility of the body portion of the magnet's coil-embraced pole with the magnet-bars accommodates rough or careless handling of the instrument without liability of displacing the tip of the said pole.

I' designates a ring or short shell of soft iron or other magnetic material. This shell is within the bobbin-containing end of case A and abuts and forms an inward extension of the diaphragm I. The said shell does not, however, extend to the narrower or magnet-bar-containing portion of the case. The said member I' forms a partial return-path for the lines of magnetism and induces more lines to pass into and through the bobbin, if, as in the case illustrated, it does not extend inwardly too far. An extension of the said member I' inwardly beyond the inner end of the bobbin would be detrimental, because it would induce a shorter path for the magnetic lines from the bobbin-embraced pole to the opposite pole.

What I claim is—

1. In a telephone-receiver, the coil-bearing bobbin supported independently of the magnet and provided with a magnetic hub or core that forms the tip of the adjacent pole of the magnet, and the body portion of the said pole consisting of magnetic strands or wires bunched and shiftable within the aforesaid tip and suitably attached to the adjacent portion of the magnet, substantially as set forth.

2. In a telephone-receiver, the combination with a case and the bobbin within the diaphragm-bearing portion of the case and having a head; of devices straddling the head at the latter's surrounding edge and at suitable intervals along the said edge, which head-straddling devices have members or portions thereof overlapping opposite sides or faces of the head and are supported from the case, and shiftable, as required, to adjust the bobbin relative to the diaphragm.

3. In a telephone-receiver, in combination with the case and bobbin within the diaphragm-bearing portion of the case and having a head, of screws having shoulders engaging or overlapping opposite sides, respectively, of the said head and screwed into the case, substantially as set forth.

4. In a telephone-receiver, in combination with the case and bobbin within the case, and having a head provided in its surrounding edge with recesses arranged at suitable intervals, of screws extending through the said recesses into the case, and each screw having shoulders overlapping opposite sides, respectively, of the head, substantially as set forth.

Signed by me at Cleveland, Ohio, this 5th day of April, 1898.

JOSEPH A. WILLIAMS.

Witnesses:
C. H. DORER,
ANNA PARRETT.